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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,647	11/20/2001	Kyu Takada	018656-249	8854

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EXAMINER

ASSAF, FAYEZ G

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/988,647

Applicant(s)

TAKADA ET AL.

Examiner

Fayez G. Assaf

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-11 and 16-19 is/are allowed.
- 6) ☒ Claim(s) 1-6, 20, 21, 24-27 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 12-15, 22, 23 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |                                                                                                              |                                                                             |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other:                                          |

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**DETAILED ACTION**

***Claim Objections***

Claims 12-15, 23, 28 and 31 are objected to because of the following:

Regarding claims 12-15, the range of values of the parameter  $j$  needs to be defined, so that the condition is always satisfied.

Regarding claim 23, 28 and 31, the claims, as best understood, recite the film having at least three layers, consequently, the value of " $j$ " is necessarily not equal and greater than 2.

Clarification and correction is required.

***Claim Rejections - 35 USC § 112***

Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase " $j=2$ " lacks antecedent basis. The claim cannot be interpreted for examination.

Correction is required.

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***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 20, 21, 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Nelson et al. (US 5,119,231).

Regarding claim 1 and 24, Nelson discloses a diffractive optical element comprising, a substrate (24 of Fig. 2) on which a diffraction grating formed by periodic depressions and projections on a surface thereof, said diffraction grating (12 of Fig. 2) having a level difference (denoted as D in Fig. 2) substantially perpendicular to a first surface of the substrate (see Fig. 2); and a dielectric multiplayer film (22 of Fig. 2) provided on the diffraction grating, wherein the layers included in said dielectric multiplayer film are arranged such that only the same kind of layers are continuous across plural successive depressions and projections of the diffraction grating (see Fig. 2).

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Regarding claim 2 and 25, Nelson discloses the level difference having a height (25 of Col. 3) which is greater than the thickness of each individual layer of said dielectric film (line 40 to line 43 of Col. 3).

Regarding claims 3-6, 26 and 27, Nelson discloses the diffractive optical element being a blaze type or a binary type (i.e. triangular and rectangular, line 67 of Col. 1 to line 1 of Col. 2), and wherein each of said layers is continuous across all of the depressions and projections of said grating.

Regarding claims 20 and 21, the method of manufacturing the diffractive optical element is inherent in the device.

Claim 30 is rejected under 35 U.S.C. 102(b) as being anticipated by the admitted prior art disclosed in the instant application.

Figure 4 which has been described by the applicant as a conventional diffractive element (page 3, line 17), discloses a substrate having a diffraction grating formed by series of depressions in a surface of said substrate, each of said depressions having a predetermined depth (G), and a dielectric film (53) on said surface of the substrate, comprising a plurality of layers of different kinds (53a and 53b) arranged in a periodic manner, said layers having a thickness such that the

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predetermined depth is an integral multiple of one period of the layers (as shown on the Figure).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art.

The prior art discloses two different kinds of layers in one period (see Fig. 4). The admitted prior art is silent on having more than two different kinds of layers.

However, reflective dielectric films having more than two different kinds of materials in HL configuration are well known.

It would have been obvious, at the time the invention was made, to a person having ordinary skill in the art to utilize more than two dielectric layers in one period so as to improve the reflectivity of the film in a predetermined wavelength range.

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It is noted that the thickness the predetermined depth being an integral multiple of one period of the layers, results in the combination satisfying the condition:  $2/n_0 = m (1/n_1 + 1/n_2 + \dots + 1/n_j)$ .

### ***Allowable Subject Matter***

Claims 7-11 and 16-19 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest the combination of the multilayer film being continuous across the level difference of the diffraction grating and having a size that is an integral multiple of a thickness of one period of the dielectric multiplayer film as set forth in the claimed combination.

Claims 22, 23 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 22, 23 and 28 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest the combination of the multilayer film being continuous across the level difference, wherein the materials of the dielectric film satisfy the conditions:  $2/n_0 = m (1/n_1 +$

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$1/n_2$  or  $2/n_0 = m (1/n_1 + 1/n_2 + \dots + 1/n_j)$  as set forth in the claimed combination in each claim.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Fayez Assaf whose telephone number is (703) 306-5526. The fax number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Fayez Assaf

3/23/03

FAYEZ ASSAF  
*Fayez Assaf*  
Patent Examiner  
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